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Comparing three stages of addiction recovery: long-term recovery and its relation to housing problems, crime, occupation situation, and substance use

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ABSTRACT

Many studies on addiction recovery focus on recovery initiation and short-term outcomes for alcohol addictions. In this study, we examine associations between three recovery stages and recovery markers for persons in drug addiction recovery. Data were collected for a multi-country study (REC-PATH) among 722 individuals living in the UK, the Netherlands, and Belgium, who consider themselves in addiction recovery for a period of three months or more. We focus on typical life domains that characterize recovery: housing, crime, work or education, and substance use. The relation with time in recovery was examined for three recovery stages: early (<1 year), sustained (1–5 years), and stable (>5 years). Using the Life in Recovery survey, cross-sectional analyses reveal that participants in later recovery stages have lower odds of having housing problems, being involved in crime, and using illicit hard drugs and higher odds of having work or education, when compared to participants in the early recovery stage. This study provides further empirical support for defining drug addiction recovery as a gradual, long-term process that is associated with various life domains beyond abstinence. The findings suggest that drug policy, treatment and research need to be oriented towards long-term objectives and recovery goals that cover multiple life domains in order to support stable recovery.

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Introduction

Defining recovery

Changing problematic substance use sustainably, often referred to as addiction *recovery*, is considered a difficult and complex process (Davidson & White, 2007). Traditionally, addiction recovery signified ‘clinical recovery,’ which mainly refers to the absence of symptoms or abstinence. However, in recent years, a scientific and grassroots movement around addiction recovery has emerged (Davidson & White, 2007). This movement originated in the United States and quickly spread to Australia (Best et al., 2016), the UK (Best et al., 2010), Canada (McQuaid & Dell, 2018) and many other countries, and has influenced how addiction recovery is defined. One of the early definitions of addiction recovery describes it as a ‘voluntarily maintained lifestyle characterized by sobriety, personal health, and citizenship’ (Betty Ford Institute Consensus Panel, 2007, p 222). This scope was later extended beyond sobriety to also include control over substance use (UK Drug Policy Commission, 2008). In the emerging paradigm, addiction recovery is associated with multiple life domains, such as (mental) health, legal issues, and social and economic functioning and wellbeing, and includes subjective

indicators such as self-esteem, empowerment, and self-determination (Best et al., 2016; Dekkers et al., 2020; Laudet & White, 2010). Furthermore, recovery is described as a personal process that can take place in various ways, depending on circumstances, context, and available support and resources (Kaskutas et al., 2014; Kelly & Hoepfner, 2015; Notley et al., 2015; White, 2007). While there are many other recovery definitions, it is clear that addiction recovery cannot be reduced to abstinence and that it concerns growth and change on various life domains.

The addiction recovery paradigm integrates elements from the addiction as well as the mental health field, two fields with many parallels in history, treatment challenges, and grassroots advocacy movements (Davidson & White, 2007). It highlights the need for a shift from a disorder-oriented approach towards a person-centred and wellbeing-oriented approach, through learning from lived experience (Slade, 2010; White et al., 2012). This shift is illustrated by the distinction between clinical and personal recovery (Slade, 2010), resulting in a conceptual paradox (Best et al., 2016). While clinical recovery refers to the absence of symptoms, personal recovery refers to personal growth and living a satisfying life, within the limitations imposed by illness (Anthony, 1993).

Thus, on the one hand, subjective states and experiences are emphasized because recovery is defined as a personal process and 'you are in recovery if you say you are' (Valentine, 2010). On the other hand, recovery is often defined through external and observable outcomes such as abstinence, well-being and social participation (Betty Ford Institute Consensus Panel, 2007; UK Drug Policy Commission, 2008). In this paper, we deal with this distinction by examining the latter empirically, within a framework that integrates the subjective aspects of recovery: participants in this study determined themselves whether and for how long they were 'in recovery.'

Stages of recovery

As the long-term and gradual nature of addiction recovery is increasingly acknowledged, it is described as a process instead of an event (Dekkers et al., 2019; Hser, 2007; Laudet & White, 2010, 2008; McLellan et al., 2000; van der Stel, 2014; White et al., 2002, 2003). The Betty Ford Institute Consensus Panel (2007) distinguished three subsequent stages in this process to indicate the stability of recovery or 'resilience to relapse': early recovery (1–12 months), sustained recovery (1–5 years), and stable recovery (5 years or more). While these stages are not empirically established timeframes, they are derived from available literature and common experiences of those in recovery. Similar timeframes are also suggested by other studies on long-term trajectories of persons entering addiction treatment. Dennis et al. (2007) showed that three years (or more) of abstinence is a strong predictor for stable recovery. Additionally, several studies, such as the Harvard Grant study on alcoholism (Vaillant, 2003, 2012) and a 33-year follow-up study on heroin addiction (Hser, 2007) indicated that five years of abstinence significantly improved the likelihood of stable recovery (Langendam et al., 2000; Schutte et al., 2001; Shah et al., 2006). However, it remains a question whether different stages of recovery are associated with different levels of improvement regarding several established recovery markers beyond abstinence.

Recovery markers

Qualitative studies of individuals in alcohol and drug addiction recovery found that there are several markers of recovery besides discontinued or reduced substance use (Kaskutas et al., 2014; Neale et al., 2014). Employment, education and training, and housing were identified as the most notable priorities for individuals in addiction recovery (Laudet & White, 2010). Employment was even cited as the top priority and was also one of the key outcome domains in the Substance Abuse and Mental Health Services Administration National Outcome Measures in the US (SAMHSA, 2008). Besides a meaningful activity, employment can provide financial and social resources, which can strengthen a person's valued and dignified societal role. Housing was prioritized more by persons with more time in recovery, suggesting that this is an important indicator of recovery progress (Laudet & White, 2010). Having stable housing (a home) can help recovery processes in various ways. Organizing and dealing with

everyday issues and being responsible for making choices about one's home offers opportunities to take more control over one's life (Borg et al., 2005) and offers a way of interacting with the surrounding neighbourhood and community (Topor et al., 2011). Consequently, stable housing can improve empowerment and citizenship. Furthermore, criminological studies that highlight the complex relationship between substance addiction and offending found parallels between processes of addiction recovery and desistance from crime (Best & Colman, 2019; Best & Savic, 2015; Colman & Vander Laenen, 2017). Tackling addiction can reduce and prevent crime (Gossop et al., 2005; Ministry of Justice, 2017; Wen et al., 2017), while on the other hand, involvement in criminal behaviour can be a barrier for addiction recovery. The question remains, however, how recovery processes relate to such life domains over time and how they develop across the recovery journey. In order to gain a better understanding of this, the current paper examines the relationship between different stages of recovery and occupational situation (employment and education), housing problems, involvement in crime and the criminal justice system, and substance use.

Relevance of the study

Conceptualizing addiction recovery as a long-term process should shape the way treatment, policy, and research is organized. However, this is currently not the case (Best & Colman, 2019; Laudet & White, 2010). Addiction treatment is mostly delivered via relatively short interventions (Dennis & Scott, 2007), often followed by relapse and multiple readmissions (Dennis et al., 2005; Scott et al., 2005; White & Evans, 2013). Consequently, the current model of care may not meet the long-term needs of a substantial group of persons seeking recovery (DuPont et al., 2015; Hser et al., 1997). In addiction research, post-treatment studies often have short follow-up periods (one or two years) focused on single treatment episodes (Hser et al., 1997; Laudet & White, 2010, 2008; McLellan et al., 2005; Morgan, 1994; Simpson, 2002; Simpson & Joe, 2004). As a result, there has been substantial interest in recovery initiation, but far less in the processes involved in sustaining recovery, and even less so for persons with illicit drug addictions (Laudet & White, 2008; McAweeney et al., 2005). To address this limitation, some authors have argued that five years should be used as a standard for assessing the effectiveness of treatment interventions (DuPont et al., 2015). Such a long-term approach could potentially challenge the typical short-term treatment and research paradigms.

Life in Recovery studies

A recent body of studies, designed to capture and understand addiction recovery pathways, was conducted in the United States (Laudet, 2013), Australia (Best, 2015), UK (Best et al., 2015), and Canada (Mcquaid et al., 2017). Using the Life in Recovery (LiR) methodology, these studies included participants in different stages of recovery and measured a wide range of experiences of individuals in recovery. The

initial study (Laudet, 2013) commissioned by Faces and Voices of Recovery (FAVOR), a recovery advocacy organisation in the US, looked at the three aforementioned recovery stages and measured items on key life domains which are typically affected by addiction, such as health functioning, work, and legal and social domains. The author concluded that 'recovery from alcohol and drug problems is associated with dramatic improvements in all areas of life' (Laudet, 2013, p. 3). Similar findings were reported in the other LiR-studies (Best, 2015; Best et al., 2015; McQuaid et al., 2017).

This paper extends this body of knowledge to continental Europe and specifically to individuals in drug addiction recovery (Best, Vanderplasschen, et al., 2018). As part of the larger multi-country Recovery Pathways study (REC-PATH), we used the LiR to assess the association between the aforementioned recovery stages (early, sustained and stable) and established recovery markers in the UK, the Netherlands, and Belgium (Flanders). These countries were chosen as they are characterized by marked differences in the timing of the initiation of national recovery-oriented drug policies. The shift to a recovery-oriented drug policy started early in the UK in 2008 (Best et al., 2010), later in the Netherlands in 2013 (GGZ NL., 2013), and not until 2015 in Belgium (Flanders) (Van Deurzen, 2015; Vanderplasschen & Vander Laenen, 2017).

Previous Life in Recovery studies (Best, 2015; Best et al., 2015; Laudet, 2013; McQuaid et al., 2017) found differences in recovery experiences between men and women. In Canada, for example, mental health problems were found to be a significantly more important factor for the initiation of recovery for women compared to men, and women reported greater untreated mental health or emotional concerns and more family violence (McQuaid & Dell, 2018). Therefore, gender differences were anticipated in this study as well. The primary research question is whether recovery markers on various life domains (housing problems, being involved in crime or the criminal justice system, having work or education, and substance use) differ between recovery stages and whether this applies similarly to both men and women.

Method

Life in Recovery survey

This study builds on previous research using the same survey: Life in Recovery (LiR) (Best, 2015; Best et al., 2015; Laudet, 2013; McQuaid et al., 2017). As opposed to previous studies, the current study focused exclusively on individuals with a history of illicit drug addiction. Consequently, some items were modified. The LiR also functioned as a recruitment tool in the larger REC-PATH study (Best, Vanderplasschen, et al., 2018), where we aimed to recruit 250 persons in each participating country, including equal proportions in each stage of recovery and an even balance between men and women. LiR participants were asked whether they wanted to continue participation in the REC-PATH study, which included an extensive baseline and follow-up survey and, possibly, an in-depth qualitative interview.

In total, 722 unique individuals completed the LiR between January and June 2018. This convenience sample

was recruited using the same recruitment strategy in each country. We used social media, newsletters, conferences, alcohol and drug magazines, and printed flyers and posters to disseminate the call for participants and contacted prevention and treatment organizations to spread the call. 'Anyone in recovery for at least three months or who has stopped or reduced problematic drug use for at least three months' was eligible to participate and invited to visit the project website and fill out the online survey. On the project website (<https://www.rec-path.co.uk/>), potential participants could access information about the study and give informed consent to access the survey. Several partner organizations and addiction recovery networks engaged to support the recruitment of study participants. Each country team ensured local ethics approval (METC Erasmus MC, the Netherlands; SHU Ethics Committee, UK; UGent Ethics Committee, Belgium).

We used online ($n = 582$) and printed ($n = 140$) surveys, to accommodate eligible participants that preferred a paper survey. The median completion time for the online surveys was 18.65 minutes. On the website, participants could choose the UK, Dutch or Belgian (Flemish) version of the survey. All materials were available in English, Dutch, and Flemish. A collaborative and iterative approach (Douglas & Craig, 2006) was employed to translate the original English survey. Back-translation was performed by a native (English) speaker, followed by a small pilot study with a client panel (from addiction services), not associated with the project. No changes were needed after this pilot.

Variables

In this paper, we assess the relation between recovery stage and several recovery markers, while controlling for various covariates. The variables that were used in the analyses are described below.

'Recovery stage' was measured by asking 'How long do you consider yourself in recovery? [years, months]'. The sample was then divided into three groups: those in early (<1 year), sustained (1–5 years), and stable recovery (>5 years) (Betty Ford Institute Consensus Panel, 2007).

Housing problems, crime or criminal justice system involvement, and occupational situation were all measured by multiple items that were combined to create composite variables. Each item had two response categories (yes/no). If participants answered 'yes' to one (or more) of the items related to the variable, it was scored as '1'; if they answered 'no' to all questions, it was scored as '0.' Having 'housing problems' was measured with 'Have you been having acute housing problems in the last 30 days?' and 'Have you been at risk of eviction in the last 30 days?'. 'Crime or criminal justice system involvement' was measured by asking: 'Have you been involved in offending in the last 30 days?' and 'Have you been involved with the criminal justice system in the last 30 days?'. 'Occupational situation' was assessed with: 'Have you been working full-time in the last 30 days?', 'Have you been working part-time in the last 30 days?', 'Have you been at college, university, or any other form of education including online course work in the last 30 days?', and 'Have you

volunteered in the last 30 days?'. 'Substance use in the last 30 days' was measured by asking how many days of the last 30 days participants had used alcohol, heroin, cocaine, crack cocaine, amphetamines, ecstasy/MDMA, cannabis, methadone, buprenorphine, and/or other illicit substances. These items were combined to create four dichotomous (yes/no) variables: 1) 'alcohol use in the last 30 days,' 2) 'illicit hard drug use in the last 30 days,' 3) 'cannabis use in the last 30 days,' and 4) 'abstinent from illicit drugs, alcohol, and opiate substitutes in the last 30 days.'

Various sociodemographic variables were collected and used as covariates in the analyses. 'Age' was used as a scale variable defined in years. Level of 'education' consisted of three categories: none or primary education, secondary education, and higher education. As 'none or primary education' did not have sufficient cases, it was combined with secondary education into the category 'lower education.' 'Country' was reported by asking participants 'Where do you live?'. England, Wales, Northern Ireland, and Scotland were combined into one category: the UK. 'Gender' had three answering options: man, woman, and other. Three participants answered 'other' and were excluded from the analyses for lack of power. Gender was also included in the interaction model analyses to assess the interaction effect of gender with the recovery stages.

The LiR also included retrospective variables related to the dependent variables ('Housing stability,' 'Crime,' and 'Occupational situation'), preceding the period participants initiated recovery: 'While you were experiencing problematic drug use, did you: (1) have stable housing? (2) get arrested? (3) have criminal charges laid against you? (4) complete a term of conditional release? (5) serve jail or prison time? (6) remain steadily employed? (7) further your education or training?' [yes/no]. Items 2 to 5 were combined into one as 'crime' and 6 and 7 were merged as 'occupational situation.'

Lastly, we included several descriptive variables to collect basic information about the study sample. 'Problem drug (ever)' was measured by asking whether one of the substances listed was 'Ever a problem?' [yes/no] to them. 'Age first drug use' was measured by asking 'How old were you when you first used any illicit drug?' 'Treatment history' was measured by asking 'Have you ever sought or received help from one of the following services/organizations? [yes/no]: (1) 12-step fellowships, (2) Peer-Based recovery support (non-12 step), (3) Residential rehabilitation, Therapeutic Communities and/or Detox, (4) Specialist Outpatient Treatment, and (5) any other service (e.g. a church/place of worship).'

Analyses

Survey data were processed and analysed using SPSS 24. Chi-square tests were performed to report differences in sample characteristics by country (Table 1) and dependent variables by recovery stage (Table 2). Logistic regression analyses were performed to estimate associations between recovery stage (independent variable) and housing problems, crime or criminal justice system involvement, occupational situation, and substance use in the last 30 days (dependent variables),

adjusted for covariates (Table 3). Sustained and stable recovery were compared to early recovery. These analyses were also performed on separate country samples (not in tables). Lastly, interaction effects between gender and recovery stages were analysed for the key dependent variables (Tables 3 and 4).

Results

Table 1 describes the characteristics of the total sample and per country. Although the study used the same recruitment strategy in each country, those responding and completing the survey differed in several aspects. Gender distribution was similar in the UK (61% men) and the Netherlands (59% men), while relatively more men (74%) were recruited in Belgium. In the UK, more participants with higher education (70%) were recruited, while in Belgium less educated participants were recruited (75%). The most reported illicit substances that were 'ever a problem' to the participants were cannabis in the UK (70%) and cocaine in the Netherlands (67%) and Belgium (69%).

The largest proportion of participants in the UK was in 'stable recovery' (56%), while in Belgium and the Netherlands most participants were in 'sustained recovery' (respectively 44% and 46%). A relatively large proportion of persons in 'early recovery' (32%) was recruited in Belgium compared to the UK (10%) and the Netherlands (17%). Mean age of first use of an illicit substance was between 15 and 16 years. Reported 12-step fellowship participation was similar in the Netherlands (73%) and UK (75%), but much lower in Belgium (27%). Other peer-based support services were mainly reported in the UK (52%). Respondents in the UK reported less use of residential treatment (58%) compared to the Netherlands (78%) and Belgium (76%). Reported utilisation of specialist outpatient treatment was similar across all countries (around 70%). All differences between countries were significant ($p < 0.05$), except for outpatient treatment, having stable housing, being employed, and 'ever had a problem with': cannabis, ecstasy/MDMA, and other illicit drugs.

Table 2 shows the extent to which housing problems, crime, work and education, and substance use in the last 30 days were prevalent in different stages of recovery. Housing problems, crime, and occupational situation were significantly associated ($p < 0.001$) with the recovery stages. Housing problems were found to be less common for individuals in stable recovery (2%), than for those in sustained (6%) and early (14%). Being involved in crime was also less common in each progressive recovery stage: 27% in early, 12% in sustained, and 6% in stable recovery. An active occupational situation was more common in the later recovery stages, with 54% having work or education in early, 82% in sustained, and 88% in stable recovery. Illicit hard drug use was reported less in each progressive stage of recovery: 17% in early, 8% in sustained and 5% in stable recovery. For cannabis use, this was 17% in early recovery, which levelled off to 9% in sustained and stable recovery. No significant differences between the recovery stages were found for alcohol

Table 1. Differences in sample characteristics between countries.

	Total n = 722	UK n = 311	Netherlands n = 230	Belgium n = 181	p Value Chi2
Gender					0.004
Male	63.3	60.8	58.7	73.5	
Education					<0.001
Lower	50.6	30.2	59.1	74.6	
Higher	49.4	69.8	40.9	25.4	
Problem substance (ever)					
Alcohol	70.1	75.2	72.2	59.1	0.001
Heroin	37.4	56.9	17.4	29.3	<0.001
Cocaine	62.6	55.6	67.4	68.5	0.003
Crack Cocaine	33.1	46.0	23.9	22.7	<0.001
Amphetamines	56.6	60.8	47.8	61.3	0.004
Ecstasy/MDMA	43.4	44.4	45.2	39.2	0.425
Cannabis	66.5	70.1	66.1	60.8	0.106
Methadone	23.5	39.2	11.3	12.2	<0.001
Buprenorphine	11.5	22.5	2.6	3.9	<0.001
Tobacco	78.5	84.2	71.3	78.5	0.001
Prescription Drugs	41.8	55.3	29.6	34.3	<0.001
Other	19.7	15.1	20.9	23.2	0.059
Recovery Stages					<0.001
Early (<1 year)	17.6	10.3	16.5	31.5	
Sustained (1–5 years)	40.2	33.8	45.7	44.2	
Stable (>5 years)	42.2	55.9	37.8	24.3	
Ages mean (SD)	41.2 (10.7)	45.5 (9.3)	40.1 (11.2)	35.5 (9.1)	<0.001 ^a
18–29	14.5	3.6	20.4	25.4	
30–49	62.0	62.6	57.8	65.7	
50+	23.5	33.8	21.7	8.8	
Age first using illicit drugs mean (SD)	15.6 (4.4)	15.2 (3.4)	16.2 (5.6)	15.7 (4.1)	0.036 ^a
Have you ever sought/received help from..					
12-step fellowships (yes)	62.0	74.9	72.6	26.5	<0.001
Peer-based support services (yes)	38.1	52.4	29.6	24.3	<0.001
Residential treatment (yes)	68.7	57.9	77.8	75.7	<0.001
Outpatient treatment (yes)	70.4	68.2	73.0	70.7	0.467
Other services (yes)	18.1	25.4	17.4	6.6	<0.001
Before recovery					
Have stable housing (no)	49.6	53.1	45.7	48.6	0.192
Involved in crime (yes)	62.0	74.0	50.0	56.9	<0.001
Employed or studying (yes)	42.4	39.2	41.7	48.6	0.123

^aOne-way ANOVA analysis.

Note: All numbers are percentages unless otherwise specified.

Table 2. Differences in housing problems, crime, occupation situation, and substance use by recovery stage.

Recovery Stage	Early (n = 127)	Sustained (n = 290)	Stable (n = 305)	p Value Chi2
Housing problems	14.2	5.5	2.0	<0.001
Have you been having acute housing problems in the last 30 days? (yes)	11.0	5.2	2.0	<0.001
Have you been at risk of eviction in the last 30 days? (yes)	8.7	1.7	1.0	<0.001
Crime	26.8	12.1	5.6	<0.001
Have you been involved in offending in the last 30 days? (yes)	11.8	5.9	4.3	0.012
Have you been involved with the criminal justice system in the last 30 days? (yes)	15.7	7.2	1.6	<0.001
Occupation situation	53.5	82.4	88.2	<0.001
Have you been continuously working full-time in the last 30 days? (yes)	19.7	32.8	52.5	<0.001
Have you been continuously working part-time in the last 30 days? (yes)	8.7	24.1	23.3	0.001
Have you been at (...) education (...) within the last 30 days? (yes)	15.7	31.4	25.6	0.004
Have you volunteered in the last 30 days? (yes)	28.3	45.9	36.1	0.002
Substance use in the last 30 days				
Alcohol use (yes)	25.2	18.6	24.9	0.131
Illicit hard drug use (yes)	16.5	7.9	4.9	<0.001
Cannabis use (yes)	17.3	9.0	8.9	0.019
Abstinent from alcohol, illicit drugs and opiate substitutes (yes)	63.0	73.4	70.2	0.099

Note: All numbers are percentages unless otherwise specified.

use and abstinence from alcohol, drugs and opiate substitutes.

In Table 3, multivariate logistic regression analyses, including the covariates, are reported on the associations between the three recovery stages and housing problems, crime, occupational situation, and substance use. The associations found in Table 2 were confirmed for housing problems (OR = 0.34; 95% CI: 0.16–0.74 in sustained stage and OR = 0.12; 95%

CI: 0.04–0.36 in stable stage), crime (OR = 0.44; 95% CI: 0.25–0.79 in sustained stage and OR = 0.24; 95% CI: 0.11–0.51 in stable stage), and occupational situation (OR = 3.58; 95% CI: 2.18–5.85 in sustained stage and OR = 4.94; 95% CI: 2.75–8.90 in stable stage). For substance use, only the association with illicit hard drug use (OR = 0.51; 95% CI: 0.27–0.99 in sustained stage and OR = 0.40; 95% CI: 0.17–0.90 in stable stage) remained significant. For housing

Table 3. Multivariate logistic regression of recovery stage with having housing problems, being involved in crime or criminal justice, and having work or education, and substance use in the last 30 days.

	Housing problems OR (95% CI)	Crime OR (95% CI)	Occupation situation OR (95% CI)	Alcohol Use OR (95% CI)	Illicit Hard Drug Use OR (95% CI)	Cannabis Use OR (95% CI)	Abstinent from drugs, alcohol, and opiate subs OR (95% CI)
Recovery Stage							
Early	1	1	1	1	1	1	1
Sustained	0.34 (0.16–0.74)**	0.44 (0.25–0.79)**	3.58 (2.18–5.85)***	0.80 (0.48–1.36)	0.51 (0.27–0.99)*	0.60 (0.32–1.13)	1.41 (0.88–2.25)
Stable	0.12 (0.04–0.36)***	0.24 (0.11–0.51)***	4.94 (2.75–8.90)***	1.54 (0.87–2.74)	0.40 (0.17–0.90)*	0.84 (0.40–1.74)	1.00 (0.59–1.67)
Gender							
Male	1	1	1	1	1	1	1
Female	0.97 (0.47–2.02)	0.87 (0.49–1.56)	0.81 (0.53–1.24)	1.45 (0.99–2.11)	0.82 (0.45–1.49)	0.88 (0.51–1.49)	0.78 (0.55–1.10)
Age	0.97 (0.93–1.01)	0.99 (0.96–1.02)	1.00 (0.98–1.03)	0.97 (0.95–0.99)**	0.97 (0.94–1.00)	0.98 (0.95–1.01)	1.02 (1.00–1.04)
Education							
Lower	1	1	1	1	1	1	1
Higher	0.68 (0.31–1.45)	1.78 (1.00–3.18)	1.71 (1.09–2.68)*	1.52 (1.01–2.27)*	1.24 (0.67–2.29)	1.04 (0.63–2.04)	0.78 (0.54–1.13)
Before recovery: Housing							
No stable housing	1	NA	NA	NA	NA	NA	NA
Stable housing	2.05 (1.00–4.19)*	NA	NA	NA	NA	NA	NA
Before recovery: Crime							
No crime	NA	1	NA	NA	NA	NA	NA
Crime	NA	2.53 (1.41–4.51)**	NA	NA	NA	NA	NA
Before recovery: Occupation							
No occupation	NA	NA	1	NA	NA	NA	NA
Occupation	NA	NA	1.59 (1.05–2.42)*	NA	NA	NA	NA
Country							
UK	1	1	1	1	1	1	1
Netherlands	0.20 (0.07–0.54)**	1.52 (0.72–3.20)	1.58 (0.93–2.68)	0.99 (0.62–1.58)	0.84 (0.40–1.74)	1.03 (0.53–2.04)	1.15 (0.75–1.75)
Belgium	0.31 (0.12–0.78)*	6.21 (3.07–12.53)***	0.59 (0.35–1.00)	2.42 (1.47–3.99)**	1.27 (0.60–2.67)	2.30 (1.18–4.48)**	0.43 (0.27–0.68)***
Interaction effect ^a							
RecStage*Gender	0.019	0.583	0.484	0.353	0.978	0.087	0.218

* $p < 0.05$.** $p < 0.01$.*** $p < 0.001$.

NA: not applicable.

^aSeparate analysis.**Table 4.** Multivariate logistic regression of housing problems with recovery stage stratified by gender.

	Housing problems OR (95% CI)	
	Women	Men
Recovery Stage		
Early	1	1
Sustained	1.69 (0.31–9.29)	0.15 (0.05–0.44)***
Stable	0.13 (0.01–1.72)	0.13 (0.04–0.48)**
Age	0.99 (0.92–1.06)	0.95 (0.90–1.00)*
Education		
Lower	1	1
Higher	0.18 (0.04–0.77)*	1.38 (0.52–3.65)
Before recovery: Housing		
No stable housing	1	1
Stable housing	1.36 (0.38–4.94)	2.69 (1.09–6.65)
Country		
UK	1	1
Netherlands	0.14 (0.02–0.79)*	0.24 (0.07–0.86)*
Belgium	0.34 (0.06–1.88)	0.31 (0.10–0.97)*

* $p < 0.05$.** $p < 0.01$.*** $p < 0.001$.

problems, crime and occupational situation, the corresponding covariate that measured the related variable *before* initiating recovery was included in the analysis. Furthermore, separate country models of these analyses were performed, which yielded similar results, although not always significant.

The interaction between gender and recovery stage was analysed for each dependent variable in Table 3 and was only found significant for housing problems ($p = 0.019$). Men had lower odds of having housing problems in sustained (OR

= 0.15; 95% CI: 0.05–0.44) and stable recovery (OR = 0.13; 95% CI: 0.04–0.48) compared to those in early recovery. For women, no relation between housing problems and recovery stage was found (see Supplement Table for gender comparisons on each outcome measure).

Discussion

The findings from this convenience sample of 722 persons in drug addiction recovery in the UK, the Netherlands and Belgium, are in line with earlier findings about the gradual, progressive character of recovery and its relation to different life domains (Best, 2015; Best et al., 2015; Laudet, 2013; McQuaid et al., 2017). Overall, the findings reveal that people with more time in recovery are less likely to have housing problems, be involved in crime or the criminal justice system or to use illicit drugs, while it is more likely that they have work or attend education compared to participants in earlier stages of recovery. These findings were consistent across the three countries, despite marked differences in the recruited recovery populations.

Although we did not examine changes over time within individuals prospectively, this study suggests that several life domains improve over time while in recovery, which may indicate that quitting or reducing problematic substance use facilitates improvements on these domains. Vice versa, it can also mean that certain living conditions help individuals sustain addiction recovery. The latter interpretation is in line with theories of desistance from crime that claim that a

range of life events and interpersonal transitions trigger the growth of recovery capital (Best & Colman, 2019; Best & Laudet, 2010; Sampson & Laub, 2003). Having stable housing, a job or engaging in education and not engaging in crime and illicit drug use can create alternative life roles that help to sustain recovery. However, more research is needed to understand the direction of these relations and how change over time is sustained or altered by shifts in these life domains.

The findings show that the odds of having better living conditions are higher among those in sustained recovery than among those in early recovery, and higher for those in stable recovery than those in sustained recovery. Differences between recovery stages remain visible in later stages, indicating that support needs might change over time. This underlines the widening recognition that addiction recovery is a process that continues to unfold long after initiation (Dennis et al., 2014; Flynn et al., 2003; Laudet & White, 2010, 2008). Moreover, it raises the question whether long-term recovery check-ups can be beneficial (Scott et al., 2005). A recent study conducted in four Forensic Psychiatric Hospitals in the Netherlands (Schaftenaar et al., 2018) found that patients who were provided the opportunity of voluntary contact (up to two years) after treatment recidivated later and at a lower rate than patients from two control groups. Given the parallels between recovery and desistance processes (Best & Colman, 2019; Best & Savic, 2015; Colman & Vander Laenen, 2017), a similar effect can be expected in addiction treatment. This justifies further exploration of long-term monitoring and continuing care for individuals in addiction recovery to identify shifting support needs and reduce relapse rates (Vanderplasschen et al., 2019).

Longer time in recovery was associated with lower odds of using illicit drugs. While this finding may not be surprising in itself, it is important to consider this finding within the context of the broader addiction recovery paradigm in which substance use is only one of many recovery markers (Best, 2015; Best et al., 2015; Laudet, 2013; McQuaid et al., 2017). Qualitative research on people in addiction recovery showed how life priorities develop and change over time (Laudet & White, 2010), because other life domains, such as work, relationships or health, become more important than using substances. Alternatively, reducing substance use may help to improve these life domains. Given the complex character of addiction and recovery, the relationship between substance use and improving life domains is likely to be dynamic and multidirectional (Dom, 2017). Interestingly, a relation with time in recovery was not found for current alcohol and cannabis use. These substances are generally more socially accepted and regulated (alcohol) or decriminalized (cannabis) and form less of a barrier to sustaining recovery than other illicit substances. However, these results might be different when focusing on persons in alcohol addiction recovery. The findings further suggest that recovery may not require total abstinence from all substances for everyone. It underlines the notion that recovery is about more than (quitting) substance use and that people who continue to use substances can experience recovery with improvements across multiple life domains. This is in line with a recent study (Witkiewitz et al.,

2018) on individuals in recovery from alcohol use disorders that found that individuals who engage in drinking following treatment may function as well as those who are abstinent. This suggests that broader inclusion criteria (apart from abstinence) should be considered in future research and treatment, as we did in this study, and further emphasizes the importance of personally driven and contextually determined definitions of addiction recovery. Abstinence is not sufficient as a single benchmark to determine success.

The relationship between time in recovery and having housing problems was not found for women. We know, however, that housing problems are more prevalent among men (Armoedebestrijding, 2017; de Vet et al., 2019; Homeless Link, 2015; Straaten et al., 2016), so there is a greater scope for improvement for men. Furthermore, in the social housing sector at least, women with children are given housing priority (Malos & Hague, 1997). This suggests that housing support may need to be different for women and men and indicates that recovery pathways can be different for men and women. Notably, no other gender differences were found, as opposed to earlier studies that used the LiR (Best et al., 2015; McQuaid & Dell, 2018). It is plausible, however, that gender differences do exist regarding indicators that we did not analyse in this study and that there may be gender commonalities in stages of recovery for some key markers.

Strengths and limitations

The main strength of this paper is the exploration of three stages of recovery which have been suggested in previous research, but did not yet have an empirical basis. A limitation of the study is the use of a convenience sample with several country differences, albeit based on the same recruitment methods. Part of these differences may be explained by the fact that addiction and addiction recovery populations differ from country to country. In the Netherlands and the UK, where recovery-oriented drug policies have been implemented for a while, more established recovery networks exist, while in Belgium a large part was recruited through treatment networks, given the more recent recovery shift. This explains the younger age, greater number of people in early recovery, and unequal gender distribution in Belgium: it resembles the population in treatment (Antoine, 2017). This may have led to differences in recruitment. We were able to control for these differences by adding country of residence, age, and gender as covariates to the analyses and we found consistent results when analysing separate country models; although not always significant, which may be related to lack of statistical power. We are not able to assess the generalizability of our findings to the entire Dutch, UK and Belgian recovery population, since empirical knowledge on this population is not available. Nonetheless, our findings are consistent with studies that examined long-term recovery in relation to various life domains (Best et al., 2015; Laudet, 2013; Laudet & White, 2010, 2008; McQuaid et al., 2017).

The subjective definition of addiction recovery can be seen as both a weakness and a strength of this study. A weakness, because it makes it difficult to operationalize

addiction recovery and not everyone with a history of substance addiction will identify with the term 'recovery' (Doukas & Cullen, 2009). However, we used multiple phrasings and explanations of 'recovery' in recruitment messages. Moreover, we think this subjective definition is a strength rather than a limitation. *Time in recovery* is often defined as 'time since most recent use of any illicit substance' (Laudet & White, 2010, 2008). However, focusing on abstinence fails to do justice to the concept of recovery as developed in the field of addiction (Davidson & White, 2007; Laudet & White, 2010; van der Stel, 2014; White, 2007). We argue that, if addiction recovery is regarded as a personal process, it is better to not predefine it in one-dimensional inclusion criteria. This is illustrated by the positive results in a range of life domains in spite of continuing substance use among some study participants.

While our findings show that housing problems, crime and occupational situation are associated with more time in recovery, we were not able to assess changes on the individual level with our cross-sectional survey. We do not know when changes in these life domains happened and if they contributed causally to recovery stability. However, we did control for the prevalence of these issues *before* initiating recovery by including these variables as covariates and found significant differences *between* recovery stages.

Additionally, the timeframe of 30 days for outcome measures does not provide information on the stability of outcomes over longer periods of time. Furthermore, the substance use measure does not provide information on the quantity and circumstances under which substances were used, while these factors are risks for the development and continuation of addiction (Dom & van den Brink, 2016). Another limitation is that we did not define 'housing problems' in the survey, which may have been interpreted differently by respondents.

Finally, this study emphasizes the importance of individual functioning and 'normalized' living conditions (Hopper, 2007; Price-Robertson et al., 2017). Thus, it provides a decontextualized picture of addiction recovery and does not address social and structural factors that may play an important role in recovery processes (Price-Robertson et al., 2017; Vandekinderen et al., 2014). To complement the current study, qualitative research is needed to understand individual addiction recovery processes in a broader context.

Conclusion

Persons with longer time in drug addiction recovery are less likely to have housing problems, be involved in crime, use illicit hard drugs and more likely to have work or education. The current study underlines and extends the growing body of knowledge on addiction recovery (Best, 2015; Best, Savic, et al., 2018; Betty Ford Institute Consensus Panel, 2007; Kaskutas et al., 2014; Kelly & Hoepfner, 2015; Laudet, 2013; Laudet & White, 2010, 2008; McQuaid et al., 2017; White, 2007), by looking at typical life domains associated with long-term recovery and by focusing explicitly on (illicit) drug addiction recovery. Although we did not assess change over

time in another way than through retrospective self-report, the results from this study provide a first empirical basis for defining addiction recovery as a gradual and long-term process that includes distinct stages and is related to multiple life domains. In line with the broad definition of addiction recovery, our findings imply that drug policy, treatment, and research need to be reoriented towards longer-term objectives. Moreover, they highlight the importance of looking at shifting support needs over time. For future research, it is important to acknowledge that no single outcome category can define addiction recovery (success), such as abstinence. Finally, we emphasize the value and importance of studying individuals in (various stages of) recovery, in addition to the often-studied population of individuals in active addiction or treatment.

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Data availability statement

The data that support the findings of this study are available from the corresponding author, TM, upon reasonable request.

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